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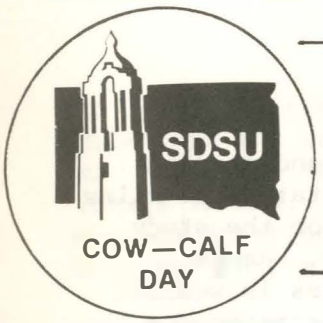

SAVORY GRAZING SYSTEM: A RESEARCH UPDATE

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Summary

Livestock performance, forage use and soil compaction were studied in Repeated Seasonal (RSG) and High Performance Short Duration Grazing (HPSDG) systems on mixed prairie in good to excellent condition in western South Dakota. In May 1981 and 1982, yearling ewes were allocated to six RSG and six HPSDG pastures and removed in October of each year. Stocking rates in both systems were periodically adjusted to result in 40 to 50% terminal use of shortgrasses. In both years, the stocking rates in HPSDG were approximately twice those in RSG. Livestock performance was the same in both systems. Forage use was more uniform and higher proportions of midgrasses were grazed in HPSDG than in RSG. Soil compaction increased with grazing intensity in RSG but was constant at a value equivalent to moderate grazing intensity in HPSDG.

Introduction

The Savory Grazing Method is a general term which includes numerous individual ranch management plans. These plans may employ any of a number of grazing systems to achieve plan objectives. One grazing system which has been closely associated with the Savory Grazing Method is High Performance Short Duration Grazing (HPSDG). HPSDG is a rotational grazing system utilizing a large number of pastures with high stocking density for short periods with the provision that (1) occupation periods are short enough that tillers are not grazed more than once per occupation, (2) key utilization species of growing range plants are grazed close enough to stimulate regrowth but not to a level which retards rapid regrowth and (3) livestock performance is not diminished because of excessive utilization of preferred forage.

Although HPSDG systems have been observed in Europe and Africa for many years, numerous basic questions about applications and limitations of HPSDG remain unanswered. Reports of HPSDG's potential for increasing carrying capacities on native range have stimulated interest in determining potential for application in the Northern Great Plains and in understanding the mechanics of the system. Consequently, a preliminary study comparing Repeated Seasonal Grazing (RSG) and HPSDG was initiated at the Cottonwood Range and Livestock Research Station near Philip, South Dakota, in 1981. The objective of the study was to obtain statistically reliable information on livestock performance, forage production, temporal patterns of tiller defoliation, tiller growth and development, spatial distribution of grazing, cumulative effects of grazing treatment on the vigor of major forage species and soil compaction in RSG and HPSDG systems, matched with respect to range sites, range condition and grazing history.

Procedures

A 2-year comparison study of RSG and HPSDG systems was conducted on native range at the Cottonwood Range and Livestock Research Station 12 miles west of Philip, South Dakota. Average annual precipitation for the study area is 15 inches. The dominant soil type is Kyle silty clay. Range condition is good to excellent. The dominant cool season grass is western wheatgrass (key management species) and dominant warm season grasses are the shortgrasses buffalograss and blue grama (key utilization species). The average long-term stocking rate (1941-1967) on similar soils on ranges in good range condition with full use was .39 AUM (animal unit months) per acre with cows and yearling steers.

The study was designed to include six pastures each in RSG and HDSDG systems. RSG pastures were single units with water and salt placement used to optimize grazing distribution. HPSDG pastures were subdivided into 16 units in a wagon wheel configuration with water and salt in the center. Most pastures and all subdivisions were separated by three-wire electric fences.

Yearling crossbred (Suffolk x Targhee) and straightbred (Targhee) ewes were allotted to replicate pastures in each grazing treatment and grazed from May to October each year. In HPSDG pastures, ewes were rotated through the 16 units at a rate of 1 day occupation and 15 days nonuse per unit, May to mid-June; 2 days occupation and 30 days nonuse, June to August; and 3 days occupation and 45 days nonuse for the remainder of the season, August to October. Stocking rates were originally set at .40 AUM per acre (1981) and .60 AUM per acre (1982) for RSG replicates and twice RSG rates for HPSDG. Provisions were made for periodic adjustments of stocking rates to insure use on key utilization species did not exceed 30% per occupation prior to mid-August and that terminal use on key use species did not exceed 50%.

Forage use was derived from periodic visual estimates of residues (dry weight basis) of the key management species and key use species in permanently located .25 meter square plots and in .10 meter square plots along paced transects at one and two dates during and one date after the end of the grazing seasons.

Soil compaction measures were obtained from depth of penetration (mm) of a tapered rod dropped from a standard height. RSG replicates were zoned according to degree of use into areas of heavy, moderate or light use. Areas dominated by midgrasses and by shortgrasses on comparable soil types within each use zone were selected for measurement. Sample points were chosen at random within the selected areas. HPSDG pasture units were divided into three zones according to distance from the center of the pasture. Selection and sampling procedures were the same as for RSG. Pastures were sampled for compaction twice during and once after the grazing season.

Results

There was no difference in the performance of yearling ewes in RSG or HPSDG treatment groups. Body weight data, shown in figure 1, suggest that sufficient quantities of nutritionally adequate forage were available to the ewes in both systems. Light weight ewes made comparable gains from May to October, 1981, and weights of mature ewes were comparably maintained throughout the 1982 grazing season.

In this study, sheep grazing preferences were reflected in their selection for shortgrasses and against western wheatgrass. Repeated grazing of shortgrass spots resulted in extremely inefficient use of available forage in RSG. Efficiency was markedly improved in HPSDG, in that spatial grazing distribution was more uniform and the amount of western wheatgrass included in the diet was greater than for RSG.

Observed disparities in RSG and HPSDG grazing distribution, determined by use estimates, were corroborated by soil compaction data. These data, shown in figure 2, suggest that soil compaction increased with increased forage use. Compaction levels were constant throughout HPSDG units and degree of compaction in HPSDG units was equivalent to the degree of compaction observed for the moderate level of grazing intensity in RSG.

Increased efficiency of harvest did not account for the apparent magnitude of difference in the carrying capacities of the two systems. Figure 3 shows cumulative percent use of shortgrasses expressed as percent use per calendar date. Figure 4 shows the relationship between animal unit months per acre and percent use. These curves suggest that carrying capacities for both systems are related to forage regrowth rates. During favorable periods for rapid plant growth, HPSDG appeared to show a marked advantage over RSG in total forage production. With environmentally induced reductions in growth rates, the apparent advantage of HPSDG over RSG was diminished and with dormancy appeared to be eliminated. These data suggest that stimulation of regrowth, due to grazing, was greater in HPSDG than in RSG. The magnitude of the differences between the systems are shown in figure 4. On the basis of these results and incomplete evaluation of additional data from this study, HPSDG appears to warrant intensive long-term research in the Northern Great Plains.

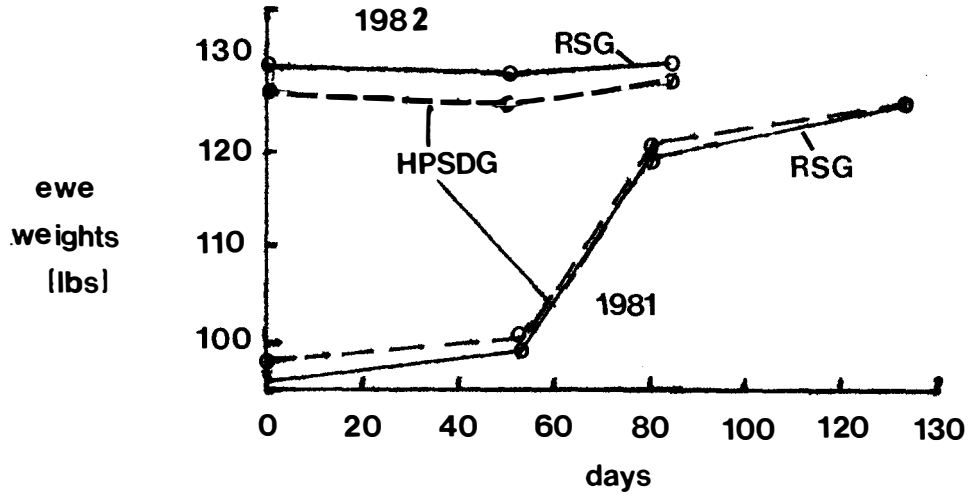
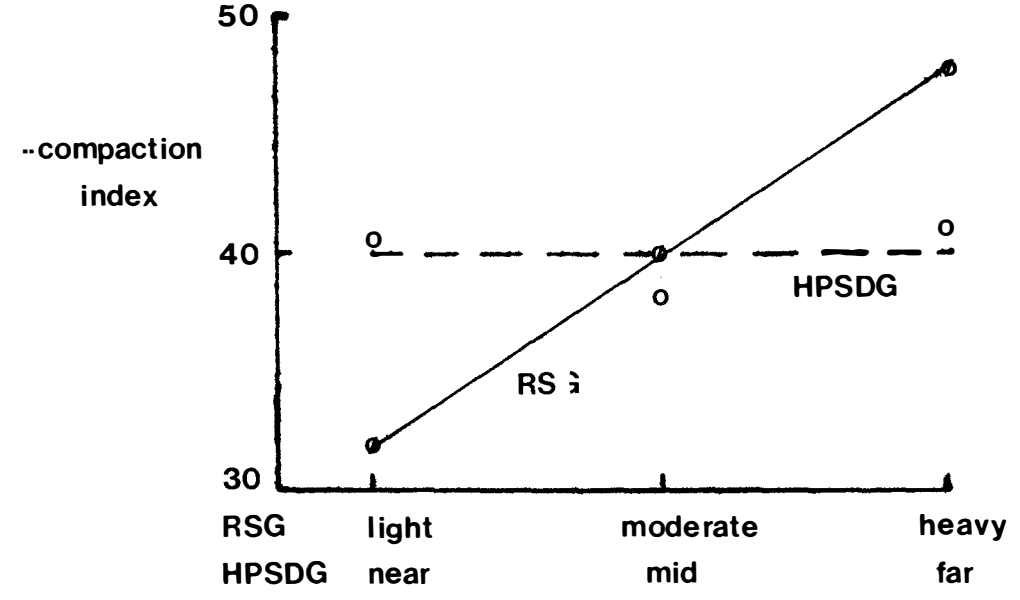


Figure 1 Livestock Performance



compaction index = 100 − penetration depth (mm)

Figure Soil Compaction

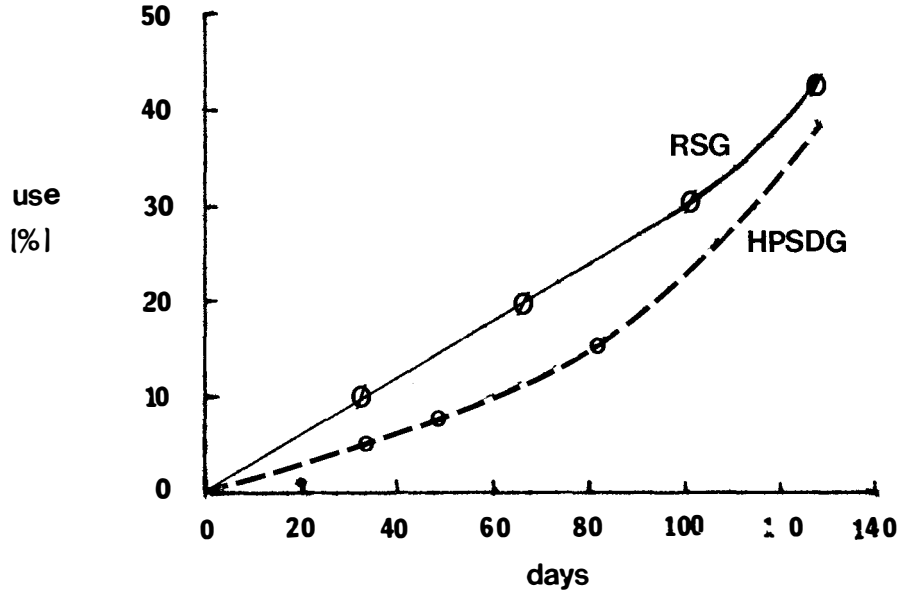


Figure 3 Seasonal Use

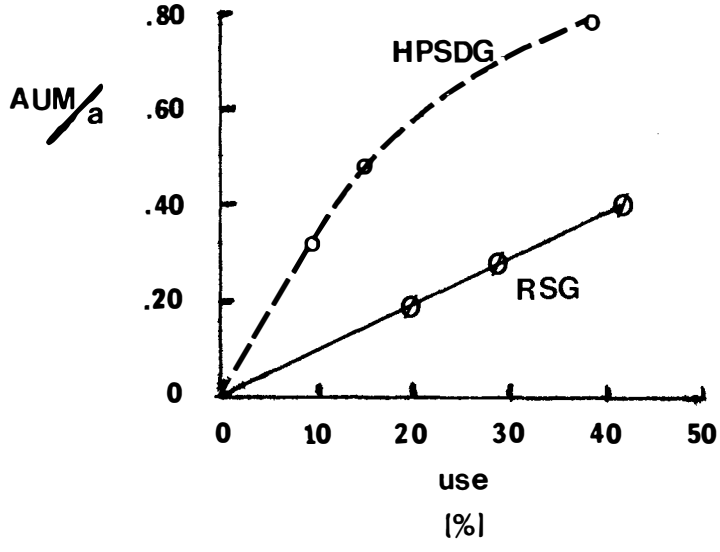


Figure 4 Stocking Rate Under Controlled Use